

REMARKS

Status of the Claims

Claims 3-20 are pending in the application. Claims 3 and 12 are currently amended. Claims 6 and 13 are canceled. Reconsideration and allowance of all of the pending claims is respectfully requested.

New matter is not being added to the application by way of this amendment. The amendment to claim 3 incorporates the subject matter of claim 6 and the amendment to claim 12 incorporates the subject matter of claim 13. Accordingly, no new matter is added and entry of this amendment is respectfully requested.

Claim Rejections – 35 U.S.C. §102/§103

Claims 3-5, 7, 11, 12, 18, and 19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Abura et al. (*J. Am. Chem. Soc.* (2003), **125**, 4149-4154). Claims 3, 4, 6, 7, 11-14, 18, and 20 are also rejected under 35 U.S.C. § 102(b) as being anticipated by Ziessel (*J. Am. Chem. Soc.* (1993), **115**, 118-127).

Claims 10 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziessel in view of Lenges et al. (*Organometallics* (2000), **19**, 1247-1254). Claims 8, 9, 15 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziessel in view of Amendola '643 (U.S. Patent Publication 2002/0083643). Applicants respectfully traverse each of these rejections for the following reasons.

A. The Present Invention

The present invention is based on the discovery that the metal hydride complex represented by formula (I) in claim 1 has the property that acid is produced upon excitation, and the resulting solution then becomes acidic. In the present invention the generation of acid upon irradiation by light means that H^+ is generated through deprotonation of the metal hydride complex upon excitation. See page 5, line 16 - page 6, Scheme 1 of the present specification.

Applicants also here attach **Exhibit 1** (Chemical Reviews, 2007, Vol. 107, No.11) which is a copy of a recent review article which refers to the present invention. See, page 5016, first column, fourth full paragraph. Exhibit 1 clearly demonstrates that those skilled in the art consider the present invention to be an unexpected and significant advance in the art. Applicants also attach **Exhibit 2** which is a copy of an article cited in Exhibit 1.

B. Distinctions between the present invention and the prior art

1. Abura et al.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP §2131, citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants respectfully submit that Abura does not expressly or inherently disclose each and every element of the present claims. Abura does not disclose exciting a metal hydride complex of formula (I) recited in claim 1 to produce an acidic solution. Accordingly, a case of anticipation is not made out and this rejection must be withdrawn.

Abura discloses a transition metal complex with iridium as the metal atom. See Abstract. However, applicants respectfully submit that there is no mention in Abura at pages 4149 and 4150 cited by the Examiner (or anywhere else in the reference) of exciting the metal hydride complex with visible light until deprotonation takes place. Abura also completely fails to disclose the production of an acidic solution as recited in claim 1. Abura at most discloses the complex itself, and dissolution into a solvent. Accordingly, all of the limitations of the present claims are not either expressly or inherently disclosed. Applicants respectfully submit that this rejection must therefore be withdrawn.

2. §102 rejection over Ziessel

Ziessel discloses catalysis of the homogeneous water gas shift reaction using a cationic iridium complex. Ziessel, however, completely fails to disclose the formation of an acidic solution as recited in the present claims 3 and 12. Ziessel therefore also fails to disclose all of the limitations of the present claims. Ziessel at page 125, right column, mentions irradiating the compound with light to produce an intermediate D. However, this step describes the production of H^{\cdot} . The H^{\cdot} then combines with H^+ from HCl to generate H_2 gas. There is no disclosure in Ziessel of exciting a metal hydride complex by irradiating the complex with visible light until deprotonation occurs thereby forming an acidic solution, as recited in claim 3.

The Examiner also refers to page 126, left column, of Ziessel. However, applicants submit that it is well known in the art that the generation of H_2 gas is a completely different process from the generation of H^+ . Accordingly, the Examiner's assertion in the Office Action that the metal hydride is irradiated to produce H_2 atoms is not relevant to the present claims. The

assertion that Ziessel produces an acidic solution is completely unsupported by the Ziessel disclosure. Ziessel nowhere mentions, or even hints at, the production of an acidic solution anywhere in the reference. Applicants respectfully submit that this feature of the present claims is not disclosed or suggested by Ziessel.

Applicants further note that Scheme II, page 124 of Ziessel cited by the Examiner is a "proposed" reaction mechanism for the homogenous catalysis of the homogeneous water gas shift reaction. See Scheme II, page 124, caption. Applicants submit that Scheme II of Ziessel is therefore not an enabling disclosure as required by 35 U.S.C. §102, since it is only a "proposed" mechanism as expressly stated in the reference. The MPEP §2121.01 states as follows (citations omitted):

The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation. A reference contains an "enabling disclosure" if the public was in possession of the claimed invention before the date of invention.

Applicants submit that the Ziessel disclosure of a "proposed" reaction mechanism amounts to a mere naming or description of subject matter, and is insufficient to anticipate the present claims. Applicants also submit that attached Exhibit 1 shows clearly that the public was not in possession of the claimed invention before the filing of the present application. Exhibit 1 demonstrates that those skilled in the art consider the present invention to be the first demonstration of the presently claimed complex as a photoacid generator. Accordingly, applicants respectfully submit that the §102 rejection over Ziessel cannot be maintained.

3. *§103 rejection(s) over Ziessel in view of Lenges and Amendola '643*

As discussed above, Ziessel does not disclose or suggest the production of an acidic solution. In the Ziessel reaction mechanism, where CO and H₂O coexist with the complex, the intermediate D immediately returns to the original structure along with the production of H₂. See scheme II. Thus, the resulting solution in Ziessel does not contain H⁺ and is not acidic.

On the other hand, in the present invention H⁺ is generated via an excited state and the solution is rendered acidic. See Page 6, Scheme 1 of the present specification. The production of an acidic solution is not disclosed or suggested by Ziessel as demonstrated above. Therefore, applicants respectfully submit that the pending prior art rejections over Ziessel in view of Lenges and Amendola '643 must be withdrawn.

Applicants respectfully submit that all of the outstanding issues in the present application are fully resolved by the present reply, and that this application is in condition for allowance. An early reconsideration and Notice of Allowance are respectfully requested.

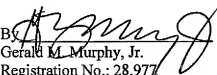
Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mark Konieczny (Reg. No. 47,715) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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Attachment: Exhibits 1 and 2

